REMARKS

Please reconsider this application in view of the following remarks. Applicant thanks the Examiner for carefully reviewing this application.

Disposition of Claims

Claims 11, 13-18, and 21 are pending in this application. Claim 11 is independent. The remaining claims depend, either directly or indirectly, from claim 11.

Rejections under 35 U.S.C. § 103

Claims 11, 13-18, and 21 were rejected under 35 U.S.C. § 103(a) as unpatentable over the admitted prior art ("APA") in view of Derwent Abstract 1973-11210U of German Democratic Republic Patent DD 94480 ("'480 Patent"), Japanese Patent 3-260413 ("'413 Patent"), and U.S. Patent No. 4,171,626 ("Yates"). This rejection is respectfully traversed.

Of the rejected claims, claim 11 is independent. Claim 11 recites a method for making a wound fiber reinforced plastic article. The method includes winding at least one single material fiber over a liner and winding a plurality of hybrid fiber layers over the at least one single fiber layer. Each hybrid fiber layer is wound in an opposed lay direction to the previously wound hybrid fiber layer, wherein the at least one single material fiber layer and the plurality of hybrid fiber layers are impregnated with resin.

The APA discusses in the background section of the present application wound fiber reinforced plastic tubing known in the art. As discussed, prior art wound fiber reinforced plastic tubing includes an inner impermeable thermoplastic liner with a hybrid layer of carbon fiber and glass formed on top thereof. However, as noted by the Examiner on page 2 of the

Office Action dated April 24, 2006, the APA fails to teach or suggest a tubing provided with an interior layer of glass fiber and an additional layer of hybrid material applied onto the same.

Given the mechanical properties of the hybrid layer formed around the liner, the APA discusses that the prior art wound fiber reinforced plastic tubing is susceptible to failure at internal fluid pressures lower than expected. For example, the carbon fiber in the hybrid layer provides a calculable increase in the expected pressure carrying capacity of the tubing. In practical application, though, the fiber reinforced tubing has not shown any significant increase in strength with respect to pressure. (*Application*, line 6, page 1 – line 10, page 2). With the current invention, the Applicant has included winding at least one single material fiber layer as an interior layer between the liner and the hybrid fiber layer to develop a wound fiber reinforced plastic tubing with a pressure carrying capacity. (*Application*, line 25, page 10 – line 2, page 11).

The '480 Patent discloses a glass-fiber reinforced plastic tube with a corrosion-resistant inner liner. Specifically, thermoplastic from a spool is wound spirally around a rotating mandrel-like support to form an inner liner of a plastic tube. Following the formation of the thermoplastic liner, resin-impregnated liners of natural or synthetic fiber, fleece fabrics, or combinations thereof are wound and formed over the inner thermoplastic liner. However, similar to the APA, the '480 Patent fails to teach or suggest any use of winding a hybrid fiber layer over an interior single fiber layer. The '480 Patent only discloses the use of a thermoplastic liner with one or more successive resin-impregnated liners formed thereon, remaining silent with respect to the use of at least two fiber layers, one a single fiber layer and one a hybrid fiber layer, as recited in claim 11 of the present invention. Thus, the '480 Patent

provides no more than the APA already discusses with respect to providing only one resin-impregnated layer wound upon a liner.

The '413 Patent discloses a fiber reinforced plastic drive shaft formed by winding and molding two or more kinds of reinforced fibers simultaneously as a hybrid layer. The two or more kinds of reinforced fiber are molded at a specific angle from ±10 to ±45 degrees with respect to the axial direction of a pipe. Glass fiber layers may then be included on the outermost and innermost surfaces of the drive shaft for improved impact resistance and deterioration prevention.

One of ordinary skill in the art would have no motivation to combine the three references of the APA, the '480 Patent, and the '413 Patent in a way that would render obvious claim 11 of the present invention. As recited in claim 11, at least one single material fiber layer is wound over a liner, with hybrid fiber layers wound over the at least one single material fiber layer. The APA, as stated by the Examiner in the previous Office Action, lacks an interior layer of glass fiber between a liner and a hybrid layer. Similarly, the '480 Patent lacks an interior layer and is additionally silent as to any use of a hybrid layer, only briefly mentioning glass as a material of the reinforcing fiber to be wound about the liner. Further, the '413 is silent on the use of a liner altogether. Thus, the three references may individually mention elements of the method recited in claim 11 of the present application, but need to be combined together in order to render obvious claim 11. As mentioned above with respect to the present invention, the use of an interior single material fiber layer between the liner and the hybrid fiber layer is used to develop a wound fiber reinforced plastic tubing with a pressure carrying capacity. (*Application*, line 25, page 10 – line 2, page 11). The '480 Patent uses an interior thermoplastic liner for corrosion resistance in the transport of aggressive liquid or gaseous media, and the '413 Patent

uses an interior glass fiber layer to prevent deterioration from electrolytic corrosion within the inner diameter of the drive shaft. One of ordinary skill in the art, though, would have no motivation to combine the three references of the APA, the '413 Patent, and the '480 Patent to improve upon pressure carrying capacitance of a fiber-reinforced plastic tube.

In reconstructing elements of prior art references to render the claimed invention obvious, the present application *cannot be used a guide. See In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991) (emphasis added). Prior art references cannot merely be combined to render a claimed invention obvious by merely showing that all the limitations of the claimed invention are found in the proposed combination. Instead, there must be a suggestion or motivation to combine the references within the prior art references themselves. Regardless of whether prior art references can be combined, there must an indication within the prior art references *expressing desirability* to combine the references. *See In re Mills*, 916 F.2d 680 (Fed. Cir. 1990) (emphasis added). There is no suggestion in the '480 Patent for the use of an interior layer single material fiber layer between a hybrid fiber layer and the thermoplastic liner. Further, there is no suggestion in the '413 Patent for the use of a liner within the drive shaft. Thus, one skilled in the art and provided with the teachings of the APA, the '480 Patent, and the '413 Patent would have no motivation to combine the three references to anticipate the present invention.

With respect to Yates, the Examiner asserts that Yates is used to support the position that the drive shafts of the '413 Patent would have been relevant prior art to the tubing of the APA, in addition to the position that the hybrid fibers of the '413 Patent are in fact multiple fiber layers disposed at opposite angles. However, Yates does not provide that which the APA, the '480 Patent, and the '413 Patent lack, with respect to claim 11. Specifically, Yates

does not show the use of at least one single material fiber layer wound over a liner, with hybrid fiber layers wound over the single material fiber layer, nor does Yates provide support to combined the APA, the '480 Patent, and the '413 Patent with respect to the above arguments.

In view of the above, the APA, the '480 Patent, the '413 Patent, and Yates, whether considered separately or in combination, fail to show or suggest the present invention as recited in claim 11. Thus, claim 11 is patentable over the APA, the '480 Patent, the '413 Patent, and Yates. Claims 13-18, and 21, which depend from claim 11, are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 17193/006002).

Dated:

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